

For  $t = -100000$  the time of rotation on this hypothesis would be about 20 seconds.

The frictional action of the tides must, I conceive, lie between the two hypotheses made; the first being probably the more accurate for large velocities of rotation. On both suppositions we are led to secular displacements of the axis of rotation, but we cannot be justified in assuming the rigidity of the Earth during such periods as would be required to produce any considerable effects from the cause here considered. On the whole I am of opinion that this cause is not available for an explanation of those secular changes of climate which geologists have shown to have taken place on our Earth.

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*Observations of the Planet Mars.* By John Joynson, Esq.

(Communicated by John Stanistreet, Esq., F.R.S.)

The observations of the planet *Mars* that have been made during the last three months have been almost entirely confined to the appearance of his disk. Every care has been taken not to examine the former observations while drawing the present appearances, to ensure as far as possible their being independently obtained, but they have resulted in confirming the former views to the fullest extent.

There can be no doubt whatever that the band is permanent, and that it extends all round the planet, with one, and as far as could be found, only one, narrow break in it. The colour of the band was generally a dark green.

The accompanying drawings are intended as a sequel to those sent in 1865 of the two previous oppositions.\*

*Waterloo, near Liverpool,*  
13 February, 1867.

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*On an Astronomical Presentiment of Immanuel Kant relative to the Constancy of the Earth's Sidereal Period of Rotation on its Axis.* By A. D. Wackerbarth.

This great man's entire works (*Sämmtliche Werke*) were about a quarter of a century ago published at Leipzig, edited by Messrs. Karl Rosenkranz and Friedrich Wilhelm Schubert. The 6th volume contains his works on Physical Geography (*Schriften zur Physischen Geographie*), and opens with a little paper of 7 octavo pages, the title of which is: "Untersuchung der Frage; Ob die Erde in ihre Umdrehung um die

\* These drawings were exhibited at the Meeting.

Achse wodurch sie die Abwechselung des Tages und der Nacht hervorbringt einige Veränderung seit den ersten Zeiten ihres Ursprunges erlitten habe, welches die Ursache davon sey, und woraus man sich ihrer versichern könne? Welche von der Königlichen Akademie der Wissenschaften zu Berlin zum Preise aufgegeben worden, 1754."\*

Such a cause he discovers in the motion of the water in the ocean caused by ebb and flood, and though the effect of this may be very small, yet, he observes, as it is for ever and unceasingly in action, a philosopher can never be justified in assuming that it cannot in the lapse of ages become sensible. He then, assuming the water at the equator to have a motion of one foot per second in a direction contrary to that of the Earth's rotation, proceeds to estimate the pressure perpendicular to the plane of a meridian, and thence to deduce the effect of the fluid mass to retard the revolution of the Earth on its axis. His result, it is true, is enormously too great, for he finds that the apparent decrease in the length of the year arising from the real increase in the length of the day would in the course of 2000 years amount to  $8\frac{1}{2}$  hours; but however erroneous this result may be, we cannot deny him the credit of having anticipated by a little more than a century (his work was first published in 1754), the hypothesis of M. Delaunay, that the Earth's rotation is sensibly retarded by the effect of the tides.

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*Meteors observed October 25, 1866, at Freemantle, West Australia.* By F. B. Duone, Superintendent of Water Police.

(Communicated by H. M. Lefroy, Esq.)

On Thursday the 25th October, at about noon, the weather being very fine but sultry, sky clear, the wind light from S.W., a considerable number of apparently small objects were seen from the water police boat at sea between Freemantle and Rottnest, to pass over head in a direction from S.W. to N.E. I recognised them at once to be meteoric bodies, some were followed by luminous trains, others not so. One very remarkable one, which particularly riveted my attention, appeared a uniformly round body and very like the planet *Venus* when seen by daylight above the period of her greatest elongation. It would be impossible to judge of their height; their rate of motion, I should say, would be about  $2^\circ$ , or four times the diameter of the Moon, in a second. The appearance of all was the same, that of star-like bodies seen by daylight,

\* Whether the Earth's diurnal rotation has at any time been exposed to any change, what may be the cause of such change, and how can we be assured of its reality? Prize question proposed by the Royal Academy of Berlin, 1754.